

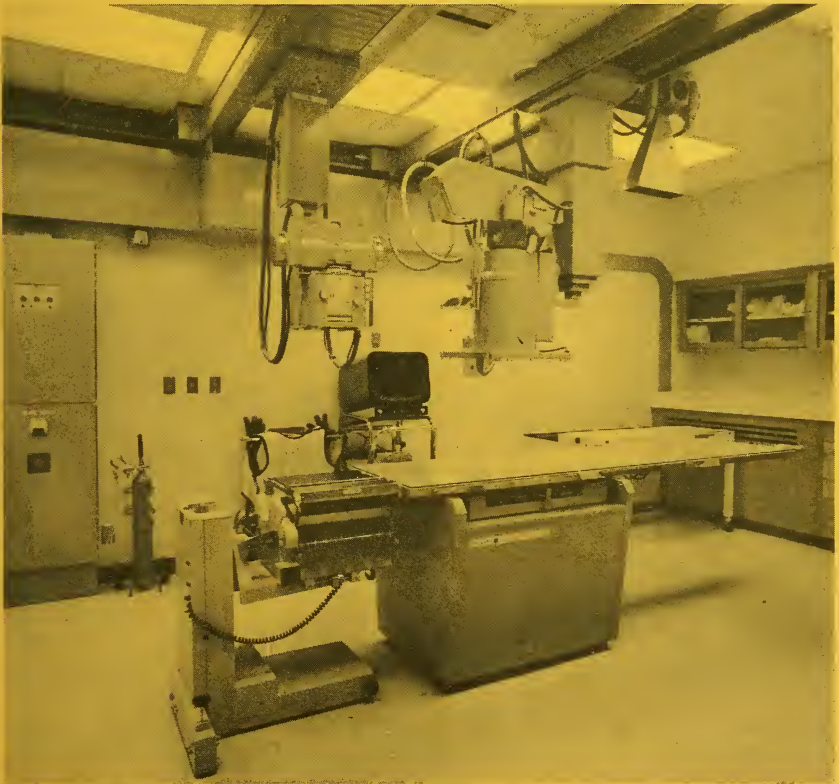
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1972

# Radiologic Technology Program

NORTHEASTERN UNIVERSITY

*Leading to the degree of Associate in Science*





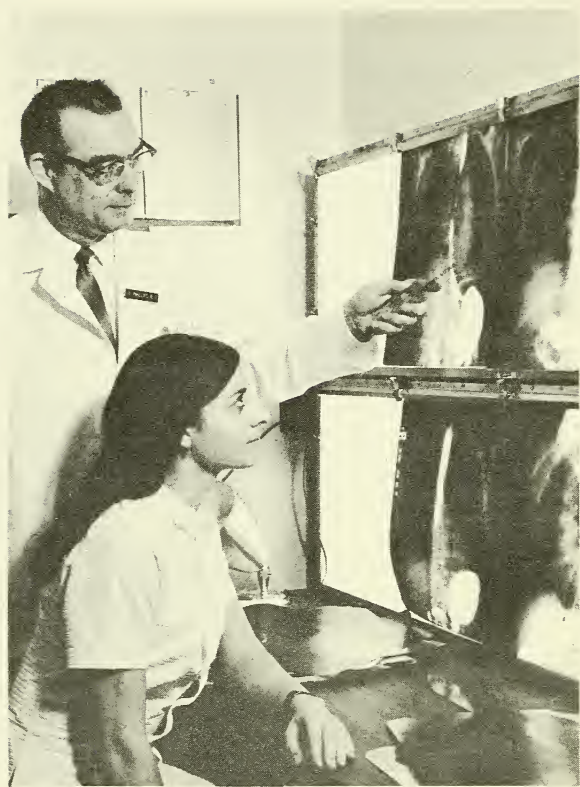
## ABOUT RADIOLOGIC TECHNOLOGY

Most people realize that x-rays and an x-ray department are found in every modern hospital. The proper name for the work carried out in this area of the hospital is Radiologic Technology. The men and women technologists who work there utilize a bewildering array of machines and electronic devices to diagnose sicknesses far more complicated than broken legs and to treat patients with radiation which offers relief far beyond the ability of common medicines. The most familiar role of the X-ray technologist is the taking of x-ray photographs, called radiographs, of broken bones. He must be familiar with all of the bones and the body organs and know exactly how to position the patient for each special picture. There are many less familiar yet very interesting and important uses of x-ray with which the technologist must be very familiar. For instance, the changes in size or shape of many body organs when they are diseased can often be seen in radiographs. Thus, the technologist who makes good radiographs may give the physician the essential clue in the diagnosis of a difficult disease. There are many practical problems which challenge the technologist in his effort to take good x-rays. Sometimes the patient is in great pain and cannot get into the usual position for the x-ray needed. The technologist needs to know all the alternate positions which can be used to get the same picture and to do this he must really know body anatomy. Sometimes the patient is so sick, he must be x-rayed in his own room in the hospital and the technologist must be able to perform his duties in a strange place and with portable equipment. Often, radiographs are needed in the middle of surgery while the patient is in the operating room.

In addition to taking x-ray pictures or radiographs, x-ray radiation is often used to treat cancer or other diseases within the body. The technologist must position his apparatus and the patient very precisely so that good tissue next to the diseased tissue will not be affected. He must know where to place protective shielding and how to pick the exact amount of radiation necessary to do the job without affecting sensitive body organs.

Still another application of the knowledge of the Radiological Technologist can be found in the field of industry. He may aid in the design of new x-ray equipment and apply his talents in its manufacture, sales, and repair.

Northeastern University offers a program in Radiologic Technology. During the first year, the student attends classes at the University for twelve weeks followed by twelve weeks of practical work at a hospital. This routine of twelve weeks of study followed by twelve weeks of practicum is repeated throughout the first year. The second year is spent entirely in the hospital. At the end of the second year, the student is eligible to take final exams, which can provide him with credits to be applied to an Associates Degree from the University and an AMA approved certificate as a Radiologic Technologist.



## **NORTHEASTERN UNIVERSITY**

Founded in 1898, Northeastern University is incorporated as a privately endowed nonsectarian institution of higher learning under the General Laws of Massachusetts. The State Legislature by special enactment has given the University general degree-granting powers. The University is governed by a Board of Trustees who are elected by and from the Northeastern University Corporation, which is composed of more than 150 distinguished business and professional men.

From its beginning Northeastern University has had as its dominant purpose the discovery of community education needs and the meeting of these in distinctive and serviceable ways. The University has not duplicated the programs of other institutions, but has sought to pioneer new areas of educational service.

In the field of adult education, Northeastern University offers graduate and undergraduate degree programs and non-credit programs which are specifically designed to meet the needs and interests of adults who wish to further their education on a part-time basis.

## **LINCOLN COLLEGE**

Lincoln College is charged with the responsibility for developing and offering college-level courses and curricula of an applied science or technological nature to meet community needs for professional personnel qualified to deal with the applications and uses of the biological, natural, and physical sciences.

## **CENTER FOR CONTINUING EDUCATION**

The Center for Continuing Education was established to relate the University to the needs of its community in a period of accelerated change. Its programs are composed of seminars, conferences, institutes, forums, and a wide variety of special courses designed to serve specific needs. The Division of Special Programs, working co-operatively with trade associations and professional societies, offers a wide variety of programs dealing with current needs and problems. Through its Division of Community Services, working with governmental agencies and community organizations, the Center is becoming increasingly involved in social problems on both the local and national level.

**For further information contact:** Professor Matthew Stevens, Director  
Radiologic Technology  
Northeastern University  
360 Huntington Avenue  
Boston, Massachusetts 02115 Tel. 437-2818

## PREREQUISITE:

Satisfactory completion of the Mathematics Placement Test and acceptance by an A.M.A. accredited School of Radiologic Technology which is affiliated with Northeastern University.

## FIRST YEAR

Two alternating twelve week terms of full-time didactic study at Northeastern University and two twelve week terms of full-time radiologic practicum and seminars at the affiliated Hospital Schools.

Didactics — 24 weeks (at Northeastern University) Q.H.

10.391, 10.392	Mathematics I, II	6 Q.H. ✓
18.570, 18.571	Gross Anatomy & Gen'l Physiology I, II	6 Q.H. ✓
86.320, 86.321	Radiologic Technology Orientation I, II	4 Q.H.
86.322, 86.323	Radiologic Science I, II	8 Q.H.
86.324, 86.325	Principles of Radiology I, II	8 Q.H.
86.326, 86.327	Radiologic Photography & Exposure I, II	8 Q.H.

Practicum — 28 weeks (at Hospital Schools of Radiologic Technology)

86.328, 86.329	Applied Radiology & Practicum I, II	6 Q.H.
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## SECOND YEAR

Full-time attendance at the affiliated Hospital Schools of Radiologic Technology. (52 weeks @ 40 hours per week — 2,080 hours)

86.344, 86.345	Advanced Radiology & Practicum	6 Q.H.
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Students who satisfactorily complete the first and second year of didactics and practicum are eligible to: Take the American Radiologic Technology examination for certification as a Radiologic Technologist.

## THIRD YEAR

Three quarters (36 weeks) part-time evenings study at Lincoln College.

18.311, 312, 313	Biology I, II, III	12 Q.H. ✓
30.601, 30.602	Composition & Rhetoric I, II	4 Q.H.
	English Elective	2 Q.H.
86.314, 315, 316	Advanced Radiologic Technology I, II, III	6 Q.H.

## FOURTH YEAR

19.501, 502, 503	Psychology I, II, III or	6 Q.H.
21.501, 502, 503	Sociology I, II, III	6 Q.H.
45.501, 502, 503	Management & Organization I, II, III	6 Q.H.
	Humanities Elective I, II, III	6 Q.H.
86.317, 318, 319	Radioactive Isotopes & Therapy I, II, III	6 Q.H.



## ADMISSION & REGISTRATION

Applicants for the Radiological Technology program must meet the following requirements and proceed in the following manner:

- a) Be a graduate from an accredited secondary school having taken College Preparatory Courses or hold an equivalent certificate.
- b) Submit an application form to the University or affiliated hospital.
- c) Satisfactorily complete the Mathematics Placement Test or the non-credit Introductory Mathematics I and II (10.330 & 10.331) courses.
- d) Have an interview with the Radiological Technology Program Director
- e) Be acceptable to the affiliated hospital through an interview with the Radiologist.



## **TUITION & FEES**

Tuition and fees for the first two years of the program will be charged as follows:

First Payment: Due First Week of School

Tuition (one half)	\$400.00
Student Center Fee	12.50
Health Service Fee	75.00
	\$487.50

Second Payment:

Tuition (one half)	\$400.00
Student Center Fee	12.50
	\$412.50

Individual academic courses will be charged at the rate of \$26.00 per quarter credit. (third and fourth year courses)

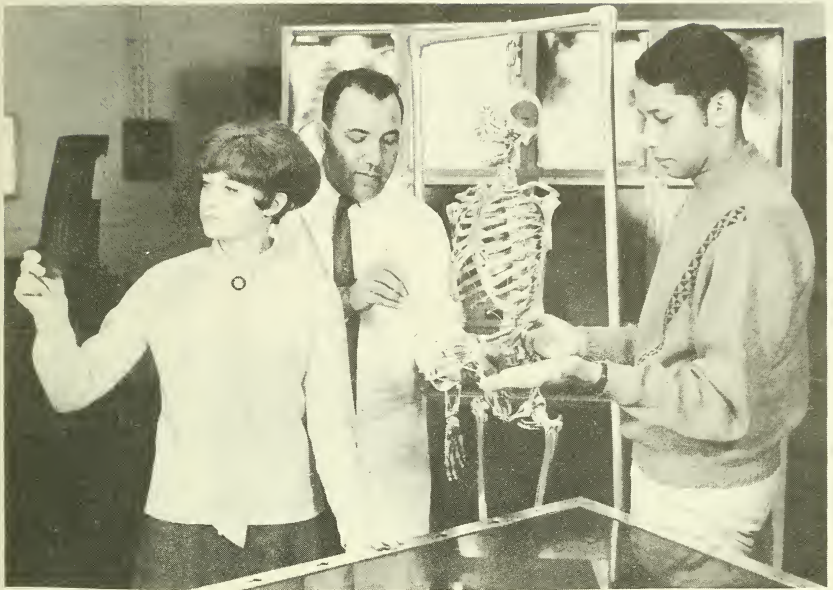
Veterans Benefits — Veterans covered by Public Law 89-358 should report to the Bursar's Office (245 Richards Hall) for information and proper enrollment forms.

## **ADMISSIONS COUNSELING**

Career planning through self-analysis and competent counseling provides an understanding of professional requirements and assists students in planning educational programs appropriate to their objectives.

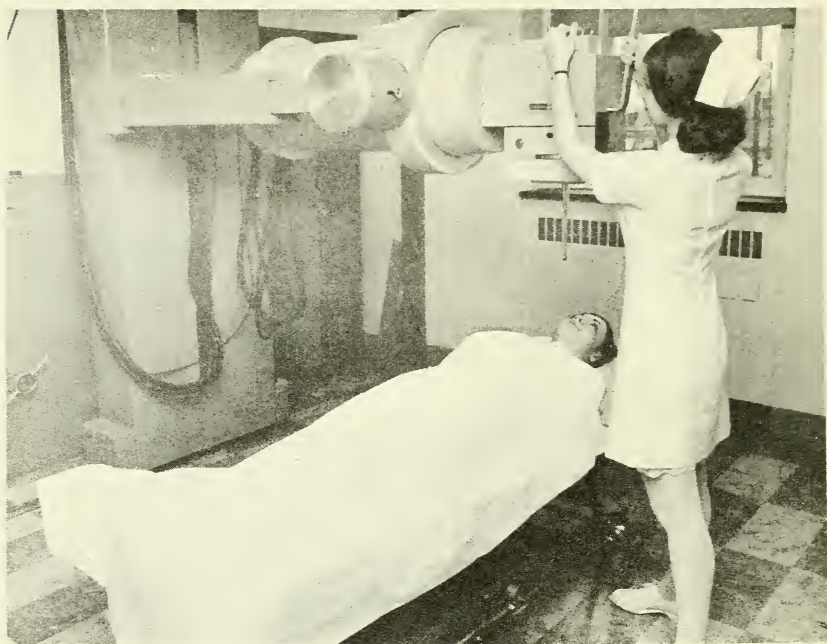
Prospective students are encouraged to arrange for personal interviews with the Lincoln College staff of program counsellors for assistance in planning their academic programs. Counselors are available by appointment at the Huntington Avenue Campus, Boston; the Suburban Campus, Burlington; the North High School, Framingham; the Weymouth High School or annex, Weymouth; and the Lynn English High School, Lynn. When records of prior education and training are available, the effectiveness of the counseling review is greatly enhanced. The University, through its Counseling and Testing Center and its Career Information Center, is also prepared to assist applicants whose educational and vocational goals are more complex or less firmly defined.





The Radiologic Technology Program operates in affiliation with the Radiologic Departments of the following hospitals. Students may contact any of these hospitals for information and enrollment procedures.

<b>Berkshire Medical Center</b>	<b>Pittsfield</b>	<b>Mount Auburn Hospital</b>	<b>Cambridge</b>
<b>Beth Israel Hospital</b>	<b>Boston</b>	<b>N.E. Center Hospital</b>	<b>Boston</b>
<b>Boston City Hospital</b>	<b>Boston</b>	<b>N.E. Deaconess Hospital</b>	<b>Boston</b>
<b>Brockton Hospital</b>	<b>Brockton</b>	<b>N.E. Memorial Hospital</b>	<b>Stoneham</b>
<b>Cambridge City Hospital</b>	<b>Cambridge</b>	<b>Newton-Wellesley Hospital</b>	<b>Newton</b>
<b>Cape Cod Hospital</b>	<b>Hyannis</b>	<b>Norwood Hospital</b>	<b>Norwood</b>
<b>Cardinal Cushing Hospital</b>	<b>Brockton</b>	<b>Peter Bent Brigham Hospital</b>	<b>Boston</b>
<b>Chelsea Memorial Hospital</b>	<b>Chelsea</b>	<b>Quincy City Hospital</b>	<b>Quincy</b>
<b>Children's Hospital</b>	<b>Boston</b>	<b>St. Anne's Hospital</b>	<b>Fall River</b>
<b>Choate Memorial Hospital</b>	<b>Woburn</b>	<b>St. Elizabeth's Hospital</b>	<b>Brighton</b>
<b>Faulkner Hospital</b>	<b>Jamaica Plain</b>	<b>St. Luke's Hospital</b>	<b>New Bedford</b>
<b>Framingham Union Hospital</b>	<b>Framingham</b>	<b>South Shore Hospital</b>	<b>Weymouth</b>
<b>Glover Memorial Hospital</b>	<b>Needham</b>	<b>Sturdy Memorial Hospital</b>	<b>Attleboro</b>
<b>Goddard Hospital</b>	<b>Stoughton</b>	<b>Truesdale Hospital</b>	<b>Fall River</b>
<b>Lawrence Memorial Hospital</b>	<b>Medford</b>	<b>Union Hospital</b>	<b>Fall River</b>
<b>Leonard Morse Hospital</b>	<b>Natick</b>	<b>University Hospital</b>	<b>Boston</b>
<b>Malden Hospital</b>	<b>Malden</b>	<b>Veteran's Administration</b>	
<b>Marlboro Hospital</b>	<b>Marlboro</b>	<b>Hospital</b>	<b>Boston</b>
<b>Milton Hospital</b>	<b>Milton</b>	<b>Waltham Hospital</b>	<b>Waltham</b>
<b>Morton Hospital</b>	<b>Taunton</b>	<b>Whidden Memorial Hospital</b>	<b>Everett</b>



## **DESCRIPTION OF COURSES**

On the pages which follow is a numerical and descriptive listing of courses offered in the Radiologic Technology curriculum offered by the Lincoln College. Although all courses are not offered every year, all will be offered during the normal period of each student's curriculum. The term "prerequisite" indicates a course that must be taken before undertaking the advanced course to which it applies.

## **ABBREVIATIONS**

Prereq. — Prerequisite

Lab. — Laboratory Hours

Cl. — Class Hours

Q.H. — Quarter Hours

## **POLICY ON CHANGES OF PROGRAM**

Lincoln College reserves the right to withdraw, modify, or add to the courses offered or to change the order or content of courses in any curriculum. The University further reserves the right to change the requirements for graduation, tuition, and fees charged, and other regulations. However, no change in tuition and fees at any time shall become effective until the school year following that in which it is announced.

## PRE-TECHNOLOGY COURSES (Non-Credit)

### 10.330 Introduction to Basic Mathematics

Prereq. None  
2 Cl., Non-Credit

A comprehensive review of high school algebra including: first-degree equations, factoring, fractional equations, work problems, and concepts of plane geometry.

### 10.331 Introduction to Basic Mathematics II

Prereq. 10.330  
2 Cl., Non-Credit

Algebraic operations with fractions and mixed expressions, proportions, square roots, radicals, quadratics, simultaneous equations, graphs, and fractional exponents. The geometry of the right triangle, areas of polygons, circles and loci problems. Basic slide rule operations.

## BASIC SCIENCE AND MATHEMATICS COURSES

### 10.391 Basic Mathematics I

Prereq. Placement Test or 10.331  
3 Q.H.

Methods and applications of algebra; graphical techniques. Linear and quadratic equations; Exponents and radicals.

### 10.392 Basic Mathematics II

Prereq. 10.391  
3 Q.H.

Variation; Review of Geometry; topics of trigonometry; introduction to statistics and probability; logarithms.

### 18.311 Biology I (General)

Prereq. None  
4 Q.H.

Universal properties and processes of living organisms. Cellular composition and cellular activities; inheritance and cellular control; the evolutionary process; environmental relationships. (Laboratory fee)

### 18.312 Biology II (Animal)

Prereq. 18.311  
4 Q.H.

Systematic comparative study of the structure and functions of animals. Diversity of animals considered from the standpoint of evolutionary adaptation. (Laboratory fee)

### 18.313 Biology III (Plant)

Prereq. 18.312  
4 Q.H.

Systematic study of the structure and function of plants, principally vascular plants. Survey of the plant-like protists, and monerans. (Laboratory fee)

**18.570 Gross Anatomy and General Physiology****Prereq. None  
3 Q.H.**

Fundamental concepts of living organisms, chemical and biological characteristics of cellular metabolism. The skeletal system and its appendages. General nomenclature, anatomical names and terms. Composition of blood, tissue and lymphatic fluids.

**18.571 Gross Anatomy and General Physiology****Prereq. 18.565  
3 Q.H.**

The systems of the body and the relationships between them. The structure and function of each system. Muscle physiology. Each system, circulatory, respiratory, digestive, vascular, urogenital, endocrine, and nervous will be discussed in detail. Special senses of the body — eyes, ears, taste and smell.

**RADIOLOGIC TECHNOLOGY COURSES****86.314 Advanced Radiologic Technology I****Prereq. R.T. or Special Permission  
2 Q.H.**

Review of basic principles; new equipment (operation); special procedures; thermography; ultrasound and video; anatomy and physiology.

**86.315 Advanced Radiologic Technology II****2 Q.H.**

The study of specialized procedures which utilize advanced and sophisticated equipment in the field of: neurology, cardio-vascular, pediatrics, tomography, inter-oral, operative procedures.

**86.316 Advanced Radiologic Technology III****2 Q.H.**

Accounting principles; budgeting; preparing schedules; personnel practices;

**86.317 Radioactive Isotopes and Therapy I****Prereq. 86.316  
2 Q.H.**

Review of Physics, mathematics, anatomy, treatment planning, radiation units of Measurement, and introduction to radioisotopes

**86.318 Radioactive Isotopes and Therapy II****Prereq. 86.317  
2 Q.H.**

Radiobiology, nursing procedures, protection and shielding, and supervoltage equipment.

**86.319 Radioactive Isotopes and Therapy III****Prereq. 86.318  
2 Q.H.**

Specific Procedures, records and administrative procedures, clinical application and radiobiology.

**86.320 Radiologic Technology Orientation I****Prereq. None  
2 Q.H.**

A study of the history of x-rays; ethics, medical terminology; nursing and dental procedures pertinent to Radiologic Technology.



- 86.321 Radiologic Technology Orientation II** **Prereq. 86.320  
2 Q.H.**  
A study of pediatrics and proper methods of immobilizing infants. Necessity for standardizing radiographic exposures to protect the patient. Medical and Surgical Diseases and the effects they cause on anatomy and physiology and the radiograph.
- 86.322 Radiological Science I** **Prereq. None  
4 Q.H.**  
A survey of the basic concepts of physics; units of measurement; Newton's Law of Motion; work; energy; atomic theory of matter; electric currents; magnetism; generators; motors; production and control of high voltage.
- 86.323 Radiological Science II** **Prereq. 86.322  
4 Q.H.**  
Interaction of x-rays and matter; nature and production of x-rays, radioactivity; properties of lightwaves; optics; heat transfer and wave motion; dosimetry; x-ray circuits and tubes.
- 86.324 Principles of Radiology I** **Prereq. None  
4 Q.H.**  
Chemistry used to process radiographic films; uses of each chemical. A study of the planes of the body; basic positioning of the skeletal system and more detailed positions utilized to demonstrate anatomical parts to best advantage.
- 86.325 Principles of Radiology II** **Prereq. 86.324  
4 Q.H.**  
Organizational factors of hospitals; financial consideration; legal considerations; proper care and maintenance of x-ray equipment test equipment necessary; special procedures used in radiology and indications for doing them.
- 86.326 Radiologic Photography and Exposure I** **Prereq. None  
4 Q.H.**  
A study of contrast materials used to visualize areas and organs of the body: Basic principles of image formation; electromagnetic spectrum; circuits used in radiology; x-ray tube construction; valve tube construction; factors controlling radiographic quality.
- 86.327 Radiologic Photography and Exposure II** **Prereq. 86.326  
4 Q.H.**  
Accessory items used to improve radiographic quality: methods of protection for patients and personnel: Effects of radiation on cells and tissue, malignant and benign; therapy planning and treatment; uses of radioactive nuclides for diagnosis and treatment.
- 86.328, 329 Applied Radiology and Practicum I, II** **6 Q.H.**  
Application of theoretical principles presented at the University by actually performing radiographic examinations under supervision until qualified to proceed alone. Assigned homework to be incorporated into the lesson plans while at the hospital; and lectures to be presented by personnel in hospital contingent with lectures at the university. As required by A.M.A. (2 hours week).



**86.344, 345, 346 Seminar in Applied Radiology I, II, III** **Prereq. 86.328, 329**  
**6 Q.H.**

A continuation of lectures as required by A.M.A. (2 hours week), radiological principles, exposure, film critique, special procedures, therapy and isotopes. Application of theoretical principles learned. Students assuming responsibility for examinations of all types (call, weekends, etc.).

## NON-TECHNICAL COURSES

**19.501, 502, 503 Psychology I, II, III** **6 Q.H.**

An introductory survey of the general field of psychology. The first term covers historical backgrounds of psychology, psychological measurement and testing, personality, behavior disorder, and psychotherapy. The second term includes maturation and development, principles of animal and human learning, memory thought, motivation, and emotion. The third term covers sensory processes, perception, social psychology, and psychology in industry.

**21.501, 502, 503 Sociology I, II, III**

Basic concepts and theories relating to the study of man as a participant in group life with emphasis on social structure, socialization, social stratification, collective behavior, population, and the major institutional areas.

**30.601 Composition and Rhetoric I** **Prereq. English Placement Test**  
**2 Q.H.**

A detailed examination of the modes of rhetoric, especially exposition and argument, and the exercises in the development of paragraphs and short papers.

**30.602 Composition and Rhetoric II** **Prereq. 30.601**  
**2 Q.H.**

A continuation of 30.601 The stress here is on the short paper, the longer library paper, and formal documentation.

**English Elective** **2 Q.H.**

**45.501, 502, 503 Management and Organization I, II, III** **6 Q.H.**

Fundamental concepts of management and organization are first developed. These concepts are then applied to the management and organization of the basic business functions: Marketing production, personnel, and finance.

Humanities electives may be selected from fields of History, Philosophy, Fine Arts, Music, Speech and Theatre Arts, Language, etc. (Descriptions available in University College Bulletin).



